12-1985

A Study Using the Initial Teaching Alphabet as a Remedial Technique for Ninth Grade Students with Learning Disabilities

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A STUDY USING THE INITIAL TEACHING ALPHABET AS A REMEDIAL TECHNIQUE FOR NINTH GRADE STUDENTS WITH LEARNING DISABILITIES

A Project Presented to the
Faculty of the Department of Elementary Education
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Education Specialist

by
Jeanette J. Conner
December 1985

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Recommended March 25, 1986
(Date)

Director of Project

Approved April 8, 1986
(Date)

Dean of the Graduate College

ACKNOWLEDGMENTS

I wish to express my gratitude to the members of my committee: Dr. Donald Ritter, who served as chairperson, Dr. John Vokurka, and Dr. Eugene Rich. I especially want to thank Dr. Rich for his encouragement to undertake this research project with the Initial Teaching Alphabet and for his personal assistance in carrying it through to completion. I deeply appreciate the committee's tolerance of the interruptions of my progress effected by the death of my father and my husband's bout with cancer in July and his heart attack in November. I also am very grateful to the personnel of the Graduate School, especially Ms. Chris Jenkins, whose empathetic understanding and help during the last four months made it possible for me to complete this project on schedule.

Dr. Gene Harryman's cooperation and assistance with the statistics was greatly appreciated. Special thanks is due Dr. Robert W. Moore, Director of Campbellsville College's Social Research Center, for his assistance with the statistical analysis.

Sincere appreciation is due Mr. Gary Seaborne, Superintendent of Taylor County Schools, who so graciously gave permission for me to undertake this research study in our school system. I also wish to thank Mr. E. L. Cox, Principal of Taylor County High School,

for his approval for this research study to be conducted in his school.

Finally, I wish to express my sincerest appreciation to my husband, Sam, without whose patience and understanding, even during his illnesses, it would have been much more difficult to finalize this research project.

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Jeanette J. Conner December 1985 59 pages

Directed by: Donald Ritter, Eugene Rich, and John Vokurka

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The reading achievement of two groups of ninth grade students with learning disabilities was compared using the standard scores on the Reading subtest of the Wide Range Achievement Test (WRAT) as the pre- and posttest measurement to determine gain in reading achievement. The experimental group used only curriculum materials written in the Initial Teaching Alphabet (ITA). The control group used curriculum materials written in traditional orthography provided for students with learning disabilities by a rural Kentucky School District. At the end of an 80-day period, the standard scores on the Reading subtest of the WRAT were compared using a t-test, multiple regression equation, Mann-Whitney U Test, and a sign test. The statistical analyses of the convergent findings of these tests indicated that the experimental group made significant gains in reading achievement while the reading achievement of the control group regressed. In addition to gains indicated by statistical analysis, observations indicated the experimental group had also made gains in self-confidence and motivation. The members of the control group appeared to become lackadaisical in their attitude and motivation by the end of the investigation.

CHAPTER I

Introduction

This investigation materialized as an attempt was made to remediate the reading disability of ninth grade students who were placed in a class for students with learning disabilities. These students had not responded positively to other remedial techiques tried throughout their educational experience. The Initial Teaching Alphabet (ITA) was selected as an alternative teaching strategy offering these students an opportunity to work with a new approach toward solving an old problem. As high school students, they were now embarrassed, frustrated, and ready to drop out of school as soon as their parents would permit.

The ITA was first explored as a method of remediation for reading problems in a graduate class called Foundations of Reading Instruction. A literature search was initiated to investigate the possibility of using ITA with a group of very low achievers. Laurita (1967) spoke of this possibility when he wrote with reference to the use of the ITA with low achievers.

> The opportunities for rehabilitating the disabled reader offered by this approach are limitless for it has within it a component lacking in the traditional alphabet. For the first time, the entire development of language skills can be recapitulated in a fraction of the time formerly

> needed. I.t.a. is in fact a kind of linguistic microcosm and it is possible by using a structured and systematic approach, to present the confused learner with the entire development of linguistic structure in encapsulated form. The disabled child can be taken from the very first stages of the reading act quickly to the point where he initially encountered difficulty, and then rehabilitated by developing the lacking skills and reinstituting progress. Once the blockage has been remedied, the development of the skills necessary for learning more mature reading functions can proceed for the disabled individual is being exposed to a system which is consistent, logical, self-motivating and highly compatible with the traditional alphabet. (p. 231)

Laurita considered the ITA method to be one that stimulates the learner through multisensory modalities including visual, auditory, and kinesthetic areas. His cognitive impressions strongly convinced him of the effectiveness of ITA that he stated:

> There does not appear to be a single valid argument sufficiently strong to prevent any teacher of the disabled from using i.t.a. as a tool with his students. (p. 230)

Most educators emphasize the importance of learning to read. Just how well students learn to read appears to depend to some degree on their native endowment, to a considerable degree on environment, and on the method of instruction. Bettelheim (1981) stated:

> The ability to read is of such singular importance to a child's life in school that his experience in learning it more often than not seals the fate, once and for all, of his academic career. (p. 5)

Improving the academic potential of secondary students who have achieved only minimum reading skills not only enhances their

success in school, but their future employability and social maturity as well. The reading deficiency problem has attracted many educational critics who agree on at least one thing: A reading problem does exist. According to Shenkman (1984), one out of every four students nationwide has significant reading deficiencies. She reported that there are about three million illiterate adults. She goes on to say that about half of the unemployed youths aged 16 through 21 are functionally illiterate and that about three quarters of the juvenile offenders in New York City are two or more years retarded in reading skills. Shenkman states:

> The educational deprivation we have usually associated with disadvantaged homes now describes most homes. More and more families have one parent, less parent-child interaction, less time for enriching experiences and language communication, and more time spent under the influence of television. (p. 88)

She considers the influence of television and lack of parental influence contributing factors to the reading deficiency problem. To help correct this problem, Shenkman advocates the following action be taken:

> Community school boards are perfect groups to serve as catalysts . . . . community involvement in schools should be radically redefined to emphasize as a primary goal the education of parents. Parents must be made aware of the insidious power of television and how to control it. Parents also must be educated to their vital role in fostering literacy through an enriched and responsive environment. Even if only one parent holds a family together, that person's educating responsibility cannot be abdicated . . . . Declining

> literacy will be reversed only if we hold parents, the community, and the television industry, as well as the school, responsible for their education of our children. (p. 89)

Since the school shares the responsibility of education all children, the group of students with learning disabilities in a high school setting was chosen as the target group for this study. The definition of learning disabilities (L. D.), as stated in the "Purpose" section of this paper, is based on the one provided by the Specific Learning Disability Act of 1969. The criteria assumes the presence of an average or above average intelligence quotient as measured by individual intelligence tests such as the Wechsler and Kaufmann Assessment Battery for Children tests. In addition, no other handicapping condition, such as mental retardation, exists.

Kirk (1972) estimated that from one to three percent at the least and seven percent at the most of the school population may be diagnosed as having learning disabilities. P.L. 94-142, the Education for All Handicapped Children Act, limits the category of learning disabilities to not more than two percent of the school-age population. Discussion of the many issues related to the area of learning disability including the controversy of labeling, numerous definition variations, etiology, methods of diagnosis, numerous instructional strategies, and

whether learning disabilities should come under the auspices of special education or reading are beyond the scope of this paper.

In 1896, Morgan, a British ophthalmologist, reported the first case of a reading disability. The case involved a 14-year-old boy who had not learned to read although he appeared otherwise intelligent (Harris and Sipay, 1985). Hinshelwood, a Glasgow eye surgeon in Great Britain, was the most prominent early investigator to attract international attention. American physicians seemed to pay little attention to reading disability until 1906 when Samuel T. Orton, a neurologist, recognized that there were multiple causes for delay in learning to read. Orton considered the primary symptom to be a severe reversal tendency (Harris & Sipay, 1985).

Interest in reading disabilities has accelerated in the United States. A vast expansion of remedial programs and an upsurge in research has resulted as federal funding became available from Title I and Title III of the Elementary and Secondary Education Act of 1965. During that time, the emergence of such terms as dyslexia and learning disability appeared with a renewed interest in determining the nature of the disability.

Harris (1975) reported that about 15 percent of American school children have reading disabilities. Boys comprise between 65 and 90 percent of the reading disability population. The deficiencies of this group include recognizing, decoding, and recalling printed words. Both the severe and less severe cases have the same problems to different degrees of severity. The readiness patterns of these children are greatly varied and must be

considered when a remedial program is selected. Harris reported

> The methods which have generally succeeded with severe cases all involve the development of clearer perception of words and the provision of additional cues which lend vividness to the memory image so that it can be retained in memory. This is done either by tying in sensory and perceptual cues from other senses, as in the kinesthetic and phonic methods, or by systematic efforts to improve visual perception and imagery, as in the predominantly visual techniques. (p. 393,1975)

Several methods similar to Harris' description are described in the literature. In 1921, Grace M. Fernald and Helen B. Keller described one such method for teaching nonreaders; that method emphasized tracing and writing as basic procedures (Harris & Sipay, 1985). Such tracing methods are called VAKT (visual-auditory-kinesthetic-tactual) methods (Johnson, 1966).

A synthetic phonic method was advocated by Dr. Samuel T. Orton and has been summarized by Mrs. Orton in the following description:

> Their common conceptual background can usually be seen in their introduction of the kinesthetic element to reinforce the visual-auditory language associations and to establish left-to-right habits of progression. Their phonetic approach is generally the same; teaching the phonic units in isolation but giving special training in blending; introducing the consonants and the short sounds of the vowels first and building three-letter words with them for reading and spelling; programming the material in easy, orderly, cumulative steps (1966, p. 144). (Harris & Sipay, 1975, p. 397)

Another method used to remediate reading disabilities is a linguistic basal reader program that stresses regularity of spelling patterns and avoids the use of words with irregular grapheme-phoneme relationships for beginning readers. The value of this method is in the consistency of the symbol-sound

association (Harris & Sipay, 1985).

Since the publication of ITA, other remedial materials have been printed in special alphabet. Two such systems use color as a mediator between phoneme and grapheme (Bannatyne, 1966; Gattegno & Hinman, 1966). Gardner (1966) reported that ITA worked better with disabled readers with at least average intelligence than with those readers who were mentally slower. Gardner seemed to like to use ITA with those children who had failed using traditional orthography (T.O.) and to use T.O. with those who had failed using ITA.

A newer method of remediation includes programmed instruction that provides self-correcting work (Harris & Sipay, 1975). While the students correct their own work, the teacher is free to work with othe students.

Many less well known and less frequently used approaches exist. Thus, the remedial teacher has several choices. The best procedures may be found by trying one method after the other until the student makes adequate progress. Adaptability to the student's needs, using his strengths and minimizing his weaknesses, is probably the most important task for the remedial teacher. Therefore, the ITA method was selected as another approach to teach a group of ninth grade students to read.

Purpose

The purpose of this study was to investigate the effectiveness of the ITA instructional strategy when used with secondary

students who had been placed in a class for students with learning disabilities as defined by the Kentucky Department of Education (1984) as follows:

> "Specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term does not include learning problems which are primarily the result of visual, hearing, or motor handicaps, or mental retardation, of emotional disturbance, or of environmental, cultural or economic disadvantage. (p. 5)

The null hypothesis presented is that there will be no significant difference between the achievement gains of the control group and the experimental group as measured by the Reading subtest score on the Wide Range Achievement Test (WRAT).

Empirical support for the hypothesis is drawn from the seven year study by Mazurkiewics (1973). An important conclusion from his study indicated that a drop of 75 to 80 percent in remediation for low achievers was realized. Langer, et.al., (1982) reported statistically superior gains with a group of junior high school students when ITA was used as the method of instruction.

Assumptions

The first assumption made is that the ITA method will be effective in teaching learning disabled ninth grade students to read. The second assumption is that the findings will be significant in spite of the small sample size in this study.

Laurita (1967) theorized that the blockage experienced by the disabled reader could be remedied by the use of ITA. After the blockage is removed, the development of the skills necessary for learning more advanced reading skills would occur because the system is self-motivating and compatible with the traditional alphabet.

In addition to aiding the child to learn to read, Stevenson (1966) reported that a significant effect of ITA was the improvement in the outlook of students, as well as an increase in self-respect and confidence.

There appears to be very few studies reported in the literature where ITA has been used with secondary students, especially in regular school settings. A study conducted by Langer, et.al., (1982) did include ninth grade students who were in a junior high school population. The ninth grade students who are the subjects in the present study were included in the high school population. The results of the Langer study are reported elsewhere in this paper.

The small number of subjects in this investigation resulted in a small volume of data. Historically some very important studies have used only one or two subjects. Plutchik (1968) called attention to the fact that out of 169 experiments published in the Journal of Experimental Psychology in 1950, five experiments involved only two subjects, one experiment used only one subject and 26 used 10 or fewer subjects.

Sidman (1960) reported that when as many as four laboratory animals yielded the same data, the experiments rarely failed to be replicated. The idea is that each experiment is part of a sequence of related experiments, not an entity in itself.

Plutchik (1968) reported that one very important study has influenced research for many years: The one Ebbinhaus conducted on memory with only one subject, himself. He reported another study done in the 1930s that provided insights into the relationship between nature and nurture when the Kellogs raised a chimpanzee with their son, as though the chimpanzee were their own child.

Limitations of the Study

The scientific method of inquiry produces estimates of truth. Thus, there are limitations in this method. A body of knowledge concerning complex issues cannot be developed within the framework of a single research study. Many research studies are necessary to accumulate significant information before the findings can be generalized to similar populations.

Limitations of this investigation include the following:

1. The small number of subjects available limits the findings to this particular population.
2. The small number of subjects limits the amount of data collected.
3. The nonrandom selection of the subjects limits generalizing the findings to other populations.

Delimitations of the Study

Two ninth grade classes with a total of nine students in the Taylor County School District, High School Program for students with Learning Disabilities were selected as the research population. The experimental group consisted of low achievers as determined by the standard scores on the Reading subtest of the WRAT. The control group consisted of higher achieving students, as determined by the same test. The experimental group was assigned to use the ITA instructional materials, and the control group was to continue using curriculum materials provided for the L. D. Program by the school system.

Definitions

The following terms have been defined as they apply to this investigation.

Achievement--Achievement refers to accumulated academic skills. In this study, achievement will be defined as the standard score on the Reading subtest on the Wide Range Achievement Test (WRAT).

Learning Disability--Learning disability (L. D.) is a term used to describe a disorder of the basic psychological processes. A complete definition is given in the "Purpose" section of this paper.

Initial Teaching Alphabet--The Initial Teaching Alphabet (ITA) is a 44-sound, 44-character lower case alphabet. Shortened variations appear in the writings of different authors. Downing used i.t.a. in referring to the Initial Teaching Alphabet. Langer used I/T/A in his research report. This investigator will use ITA except when quotes are used in which the shortened form appears.

Traditional Orthography--Traditional Orthography (T.O.) refers to the English alphabet that is generally used in English speaking countries. T.O. will be used in this paper except when it is otherwise written in quotes appearing in this study.

CHAPTER II

Review of the Literature

Downing (1967) indicated that Sir James Pitman is considered the father of the ITA. Pitman's ancestors were educators in addition to holding other jobs. Pitman became interested in simplifying the English alphabet. He evaluated different systems but finally decided to print the Ehrhardt Augumented Roman Alphabet which was a 40-sound, 42-character lower case alphabet. The ITA now has 44 characters to represent 44 sounds.

The purpose of ITA according to Pitman and St. John (1969) is to reduce the risk of reading failure in the normal population by making the initial learning tasks easier than they are when the T.O. is used. The greater simplicity of ITA, they believe, can help children who have various learning disabilities. ITA has also been used with various types of handicapped children (Downing, 1977).

Downing (1967) reported that in 1959 he approached the influential leaders in British Education for approval to undertake research using ITA in the school systems. In 1961, the first British experiments were conducted by the University of London. In 1962, Downing and Gardner conducted the first experiment using ITA with severely disabled readers in Walsall, England (Downing, 1979). The subjects were nonreaders in their third year of school.

These students received special remedial instruction four half-hour periods each week. The only difference between the control group and experimental group was that the experimental group used ITA, and control group used T. O. "The i.t.a. pupils made significantly superior progress during treatment and this was maintained after transfer from i.t.a. to T.O." (Downing, 1979, p. 290).

In 1963, Lehigh University in the United States conducted a large scale experiment with a grant from the Ford Foundation (Downing, 1967). Georgiades, in 1964, surveyed classes for disabled readers in remedial centers in England using ITA with the students but results were too difficult to interpret because of the uncontrolled conditions. However, Georgiades (1969) attempted to overcome methodological problems of informal research by conducting a rigorously controlled experiment comparing the use of ITA with T.O. for disabled readers who were between two and three years retarded in reading skills. The students were eight years old and of normal intelligence. "He found no significant difference between the i.t.a. and t.o. treatments by hypothesized that this may have been due to the limited time for treatment (half hour withdrawal per day)" (Downing, 1979, p. 291).

In 1966, Gardner compared 70 children who were taught to read using ITA with 70 children taught to read with T.O. These children were between two and three years behind in reading and

in their third year of school. Their IQ's were between 80 and 90. These students were withdrawn from their classes for 40 hours over a six month period. No significant difference between the mean scores of the groups was found. However, the ITA group scored higher than the T.O. group. He reported that 65 percent of the ITA pupils continued to make satisfactory progress after treatment ended, but only 70 percent of the T.O. pupils continued to make progress. Gardner used frequency distributions to report his findings. Block (1967) inspected Gardner's data and used the Kolmogorov Smirnov Two-sample Test which produced a significant difference at the .001 level with the ITA group scoring significantly higher.

Downing (1977) reported that in 1966 Barclay conducted an experiment at the Rockland State Hospital in New York where a large number of child patients were diagnosed as having primary behavior disorders, as schizophrenic, as having chronic brain disorders, or other neurological or psychiatric symptoms. Downing states that "The aim of Barclay's research was to determine whether, if i.t.a. actually facilitated the learning of reading and writing, it would have noticeable effects upon the psychological adjustment of our young patients" (p. 366). These boys had a mean age of nine years and mental ages just over seven years. These two groups had mean IQ's of 78 and 80. Downing reported that Barclay's results showed that the boys who were taught with ITA made progress about 30 percent more rapidly than the boys taught with T.O. According to Downing, Barclay did other experiments with emotionally

disturbed children with favorable results as indicated in his overall conclusion:

> Among emotionally disturbed children in a public mental hospital, the use of i.t.a. resulted in more rapid development of reading skills than was observed with the use of t.o. in comparable groups. More significant than the differences in their rate of learning to read, however, were the differences in the children's behavior in the classroom groups where i.t.a. and t.o. were used, and the effects on the individual personality of the children resulting from acquisition of reading and writing skills. (p. 367)

Curry (1964) conducted an experiment using ITA to teach socially maladjusted children in an English residential school for boys between the ages of 10 and 12.6 who had police records and a history of failure in school. He reported that all boys did well with ITA and were transferred to T.O.

There have been a few investigations concerning the effects of ITA on similar adult populations. In 1964, Hastings conducted a small pilot project with prison inmates at San Quentin Prison, California. According to Hastings' report (1966) seven of the illiterates made very satisfactory progress with ITA. The results could not be considered at all conclusive because of many limitations in this pilot study. But the results did suggest that major gains in reading did occur after 100 hours of classroom instruction using ITA. Hastings (1966) reported, after more research at San Quentin, teachers there concluded that ITA facilitated desired results quicker than anything else they had tried and considered ITA an excellent remedial tool for that situation.

ITA has been used with recruits in the British army. Stevenson (1966) concluded that the use of ITA made a significant impact on the general outlook of the men, who became more cooperative and less antisocial. The recruits made the transition from ITA to T.O. in their own time and without difficulty.

The findings in these studies indicate that conflict existed between authors of major published studies on the use of ITA as early as the end of the 1960s. As these conflicts were being strongly voiced, favorable impressions were being reported as informal research. Such research should be given some consideration in view of the fact that there are many causes of reading problems. In addition, some of the variability reported may be due to the amount of expertise of the instructor and the amount of time the ITA material is used.

Many school districts in England made informal reports on the use of ITA in the classrooms. Greenwood (1966) reported test results showing substantial gain, but he had no control group. However, his case study reports the gains made by a seven year old boy who had an intelligence quotient of 122. He had not started to read and was reported to be very nervous and could not concentrate for more than a few minutes at one time. After six months he started to read fluently. By the end of 12 months, the boy had changed to T.O.

Downing (1979) reported that Lane, in 1974, used ITA with fourteen sixth graders described as "hard-core" nonreaders. Lane's conclusions are reported by Downing as follows:

> The positive results provide evidence that the i.t.a. is a tool which can help remediate some of the two or three millions of severely disabled readers in the United States. It must be allowed to prove its own worth by its use as a remediation tool at learning centers and reading laboratories. (p. 292)

Some investigators have attempted to prove the worth of ITA by the use of better research designs. Mazurkiewics (1973) did a longitudinal study over a period of eleven years. His findings indicated that as a result of the use of ITA as a remedial tool, there was about a 75 to 80 percent reduction in remedial work needed by the students.

A more recent study conducted by Langer, et.al., (1982) contrasted ITA with T.O. in remediation classes for slow learners at the junior high school level. In reporting his results, Langer stated, "Our tentative assumption is that the ITA program, appropriately implemented, did make a difference in reading achievement, independent of student attitudinal/motivational factors." (p. 309)

Downing (1979) considers the strongest and most consistent evidence for the superior effectiveness of ITA to be found in the results of investigations with two particular groups of students. These are the culturally disadvantaged and those in bilingual situations. With these groups objective evidence can be found as the result of well designed scientific research. He states with regard to the results of such research, it ". . . shows quite conclusively that i.t.a. is significantly superior to t.o." (p. 297)

Downing (1979) reported the comments by Robertson and Trepper in 1974 on the results of their study of ITA with Spanish speaking children in California. The experimental group, consisting of 26 boys and 26 girls from Spanish speaking homes in a federal housing project, was taught to read with ITA. These were then compared with a similar group taught to read with T.O. The ITA group scored significantly higher on the California Test of Basic Skills and the Spache Reading Diagnostic Test. For children in the bilingual situation, the massive confusion of learning to read in a language different from their native language may be simplified when ITA is used to teach English and reading.

ITA has been used with populations of various categories of cognitive deficits. In 1979, Downing reported that research had been done with populations who had a severe reading disability, who were mentally retarded, who were culturally disadvantaged, and who were bilingual. He also referred the reader to other research on ITA with the regular beginning to read classes, with emotionally disturbed and socially malajusted children and children with sensory handicaps.

In spite of such positive research reports, there has been criticism of ITA. Questions about transition from ITA to T.O. appear to be mentioned most frequently by both researchers and practitioners. Downing (1967) reported that in Britain, the average time for transition varies between the end of the second or beginning of the third year. Ohanian (1966) reported that

in the United States, transfer occurs at the end of the first year. Another criticism leveled is that ITA is spelling reform in disguise. Downing (1969) indicated that one problem occurring with reference to the comparison of failure in ITA and T.O. is that the authors ask different questions. Thus, variant answers appear with respect to the findings of the research. The positive findings, however, appear to outweigh the negative by far in both the formal and informal studies.

ITA was selected as the strategy for the present investigation. ITA was chosen because it offered a new and different approach to high school students who had not benefited significantly from traditional instruction. A prime feature of the ITA is the simplicity of the system for relating printed and spoken language. This simplification should facilitate the disabled reader's understanding of the task of learning to read. Confusion of vowel sounds represented by one symbol is removed; thus, the disabled learner does not have an extra load placed on his already poor memory. This tool should be available to all remedial teachers for those cases and circumstances in which the use of ITA is appropriate. This strategy does offer a different approach to those learners who have experienced years of failure with T.O.

CHAPTER III

Methods and Procedures

Institutional Setting

Taylor County High School is one of four schools in the Taylor County School District with a student population of approximately 1,000. This school was selected as the site for this study because the investigator was employed as a teacher by the Taylor County Board of Education for the High School Program for Students with Learning Disabilities. Taylor County is a rural setting. Many of the parents of the students work at one of the three major factories in the area. Many of the families have farm operations in addition to their factory jobs. Taylor County is the home of Campbellsville College, a four-year liberal arts college associated with the Southern Baptist Convention.

Classroom Setting

Treatments for the experimental and control groups were conducted in the classroom for students with learning disabilities. The tables and counter tops in the classroom provided ideal work space for students. The room had two doors and one window, fluorescent lighting fixtures, air conditioning, heat, ten portable desks and chairs and six stools to use for work at the counters.

This classroom was part of the Taylor County Junior High School building.

Subjects

The subjects for this investigation were two groups of ninth grade students who were placed in the High School Program for Students with Learning Disabilities. The guidance counselor had previously assigned these subjects to their respective group without regard to this investigation. Five subjects were in one group and four subjects were assigned to the other group. The classes were assigned, respectively, as experimental and control groups based on the standard scores on the Reading subtest of the WRAT as lower and higher achieving subjects.

The subjects ranged in age from 14 years to 15 years, six months. The experimental group consisted of five male students. These subjects ranged in IQ, as measured by the Wechsler Intelligence Scale for Children, Revised (WISC-R), from a full scale of 73 to 102. The control group consisted of four subjects, two female and two male. One male subject dropped out of school soon after the program began. Therefore, his data were not used in this study. The subjects in the control group ranged in IQ from a full scale of 84 to 101. All subjects in the study had been receiving instruction for the remediation of reading difficulties since they were in the second and third grades.

Procedures for Protection of Human Subjects

Subjects were informed that they were participating in a special project to find out if they could learn to read by using

a different alphabet. A Consent Form (Appendix A) was sent home to the parents describing the treatment and seeking their approval for their child to participate. Permission was requested for the results to be reported in written and/or verbal form without the name of any subject being reported. Only fictitious names will be used. All parents returned the consent form with their signatures.

Treatments

The initial planning for this investigation began early in the Spring of 1983. Eugene Rich, Professor in the Reading Department at Western Kentucky University, Bowling Green, Kentucky, served as a consultant. The investigation began in September 1983 and was completed at the end of the school year in May 1984. From September to December 1983, both the control group and the experimental group received the same treatment at two different class periods during the morning hours of the school day. The materials used were those provided by the Taylor County High School for students with learning disabilities.

Control Group (TO)

From January to May 1984 the control group continued with the same curriculum program that began in September 1983 and was completed in May 1984. All material used was written in T.O.

Experimental Group (T1)

Curriculum materials for use with the experimental group were purchased from the Initial Teaching Alphabet Foundation,

32 Thornwood Lane, East Hills/Roslyn Heights, New York, New York 11577. These materials, which included a workshop kit for the teacher, were studied for six weeks before any materials were presented to the students.

The instructions provided for the introduction of the 44 characters to the students before any printed material was presented. The printed material designed for reading lessons was presented in five levels of reading books with accompanying workbooks.

The students received instruction for 80 days using only ITA instructional materials according to the following schedule with a few exceptions that will be discussed in the findings. An arbitrary schedule that divided the 80 days into 10 to 20-day segments provided a goal for each division of the materials that was to be used. Each student was still allowed to read at his or her own pace.

Schedule of Instruction

Days 1-10	The ITA symbols were presented according to the instructions in the Teacher's Manual.
Days 11-30	Subjects began reading from the first level in the reading series.
Days 31-40	Subjects who completed the first level successfully, i.e., not missing any words when reading orally to the teacher and answering 90 percent of the questions in the workbook, began the second level in the reading series. Two students had not completed the first level successfully until the 35th day. They began the second level at that time.
Days 41-50	Subjects learned to spell the names of the days of the week in ITA. They began to write sentences in ITA. The third level of reading was started by most subjects, while one subject had to complete the second level.

Days 51-60 Subjects began the fourth level in the series. Three subjects completed the third level during this time, but these subjects started reading the fourth level a few days before the others finished the fourth level.

Days 61-70 Some subjects completed their workbooks for the third level. Some completed the fourth level while others began the fifth level. One subject completed all the reading and his workbook on the 64th day and returned to the regular L. D. curriculum. Another subject was permitted to return to the regular L. D. curriculum because he refused to do any more work on the project.

Days 71-80 All subjects completed the fifth level of the reading series and the workbooks. Those who finished ahead of schedule began rewriting sentences from ITA to T.O. The third level reading book was used for this exercise. Each subject selected the sentences he would rewrite in T.O. All subjects, with one exception, completed all the assignments by the last day of the schedule. One subject completed the work on the 82nd day.

Instrumentation

The WRAT was standardized in 1936 as an instrument to be used in the study of the basic school subjects of reading, word recognition and pronunciation, written spelling, and arithmetic. The WRAT is reported to be of value in accurately diagnosing "disabilities in persons of all ages" (Jastak & Jastak, 1978, p. 1) in the academic areas of reading, spelling, writing and arithmetic, and in determining the approximate instructional level for placement purposes.

The Reading subtest of the 1978 revision of the WRAT was used in this investigation. The three subtests, Reading, Spelling, and Arithmetic, are divided into Level I and Level II. Level I is for use with children between ages five years, zero months to

11 years and 11 months. The time required to administer the three subtests is from 20 to 30 minutes.

The test form is printed on a four-page booklet which provides for the recording of basic demographic information on both levels of the three subtests. Tables are provided for calculating raw scores of each subtest. Grade ratings, standard scores, and percentile ranks taken from respective standardization tables in the manual are recorded on the front of the booklet.

Level I of the Reading subtest consists of four parts: naming two letters in the written name of the subject, identifying letters by form, naming letters, and pronouncing words. An accumulated raw score of 100 points may be achieved. The first three parts are considered "pre-reading" level and are administered only to children who make errors in the first line of the reading test. Specified time limits are imposed in standardized administration. The entire subtest must be administered individually.

The validity of the WRAT has been attested adequately by many researchers. R. F. Wagner of the Richmond Public Schools, Richmond, Virginia (Jastak & Jastak, 1978) conducted a validity study with the WRAT Reading subtest. He correlated WRAT Reading scores with teacher's ratings of achievement on a nine-point scale. The correlation extended to +.88. Jastak and Jastak stated "The scores of the WRAT subtests, if valid, should show clearcut variations in the level of achievement of groups differing in

general ability, educational proficiency, and cultural opportunity" (p. 49). Five groups were compared, and the results of that comparison are presented in Table 18 of the 1978 WRAT Manual.

In another study, Jastak and Jastak (1978) reported that

> The most comprehensive and best designed study of school achievement was completed by the U. S. Public Health Service under the direction of Lois R. Chatham. The survey was based on a national sample of school age children from the first to the twelfth grade. The Standford and Metropolitan Achievement Tests were compared with the Wide Range Reading and Arithmetic Subtests. . . .The WRAT Reading is in each case more highly correlated with verbal coding tests. (p. 53)

The WRAT is simple to administer and easy to score, making it a practical test to use in this investigation. The format is similar to that of weekly tests in the classroom; thus, the students do not have the apprehension they would have if the formats were complicated.

CHAPTER IV

Findings, Conclusions and Recommendations

A Comparison of ITA and Conventional Instruction

There were five subjects in the treatment group and four in the control group. However, one of the control group subjects dropped out of the program, and data on that subject are excluded from this analysis. Thus only three subjects in the control group provided data for the project.

Given the small number of cases, caution must be exercised in interpreting statistical tests and in making generalizations. To overcome this problem, several analytic approaches were used. Conclusions will be based on a convergence of results from these different analytic approaches.

Statistical Analysis

The first step in this analysis was to examine differences between the two groups that might have existed before the treatment began. Table 1 shows the raw and average verbal intelligence quotients and pretest scores for each group. A t-test indicates that the difference between the mean verbal IQ scores for the two groups is not statistically significant ($t[6] = .62$; $p = .02$). However, the difference in the mean pretest scores is statistically significant ($t[6] = 3.19$; $p = .02$). The experimental group had an

Table 1

Raw and Average Verbal IQ and Pretest Scores by Group

Subject Number	Verbal IQ	Pretest
Treatment Group		
1	79.00	70.00
2	107.00	100.00
3	73.00	72.00
4	77.00	74.00
5	92.00	84.00
Mean	85.00	80.00
Standard Deviation	13.90	12.40
Control Group		
6	87.00	99.00
7	101.00	98.00
8	84.00	94.00
Mean	90.70	97.00
Standard Deviation	9.10	2.70
t (6)	.62	3.19
p	.56	.02

average pretest reading score of 80.0, whereas the control group had an average pretest reading score of 97.0.

This initial difference has two possible implications for interpreting change scores. The first is that the experimental group appears to be made up of lower achievers than the control group. Thus, unit score improvements for this group represent a greater accomplishment than in the comparison group because the treatment group is the more severely deficient set of readers.

On the other hand, a finding of statistically better change scores in the treatment group may be partly due to statistical regression to the mean (Campbell, 1970). This threat to the validity of findings cannot be ruled out with the research design that was implemented. More confidence in significant findings would be justified if the two groups were initially equivalent in statistical terms. Since it was not possible to randomly assign students to the treatment groups, not only the pretest scores but also other unmeasured factors as well may account for outcome differences. Also, the possibility of statistical regression to the mean should be taken into account in interpreting the findings.

The second step in analysis is to examine the changes in reading achievement scores for the two groups. Table 2 shows the average and raw pretest, posttest, and change scores for the two groups. The difference in the mean posttest scores is not statistically significant. However, the average change scores are statistically significant in their difference ($t[6] = 5.97$; $p = .001$). The experimental treatment group showed an average

Table 2

Raw and Average Pretest, Posttest, and Change Scores by Group

	Reading Achievement Scores		
Subject Number	Pretest	Posttest	Changes
Treatment Group			
1	70.000	70.000	.000
2	100.000	109.000	9.000
3	72.000	81.000	9.000
4	74.000	82.000	8.000
5	80.000	86.000	5.000
Mean	80.000	86.200	6.200
Standard Deviation	12.600	14.500	3.800
Control Group			
6	99.000	96.000	- 3.000
7	98.000	93.000	- 5.000
8	94.000	89.000	- 5.000
Mean	97.000	92.700	- 4.300
Standard Deviation	2.700	3.500	1.200
t (6)	3.190	1.020	5.970
p	.020	.560	.001

increase in achievement scores of 6.2, whereas the control group showed an average decrease in scores of 4.3. The average net difference in the change scores for the two groups is 10.5, a value that is significantly different from the null hypothesis value of zero.

While it appears that the treatment group effect was significantly better than the control group effect, the possibility of statistical regression as a threat to the validity of this result must be taken into account. The decline in the control group scores may be attributable to end-of-year disinterest that students often experience. The uniqueness of the ITA method may account for the continued high interest of the experimental group.

Another approach to analyzing these data is to use a multiple regression model. Table 3 shows the analysis of variance and parameter estimates (with tests of significance) for a regression model in which posttest score is the dependent variable and IQ, pretest score, and group scores are independent variables. (Group, a nominal variable, may be used in the regression model, which assumes an interval level of measurement, because it is dichotomous. The treatment group subjects are assigned a value of one and the control group subjects a value of two.) The results indicate that when verbal IQ and pretest scores are controlled, group assignment (treatment) is still a statistically significant predictor of posttest scores.

Table 3

Multiple Regression of Posttest Scores on Verbal IQ, Pretest Score, and Group Assignment

Analysis of Variance

Source	Sum of Squares	Degrees of Freedom	Mean of Squares	F	Probability
Regression	906.7	3	302.3	38.9	.004
Residual	31.1	4	7.8	7.8	
Total	937.8	7			

Squared Multiple Correlation = .96

Standard Error = 2.79

Estimates of Parameters

Variable	Coefficient	t-ratio	S. E.	Probability
Verbal IQ	- .33	-1.57	.21	.191
Pretest	1.50	5.80	.26	.005
Group	-17.35	-4.32	4.02	.014
Constant	12.00			

Regression Equation = $Y' = 12.00 - .33 \times VIQ + 1.50 \times Pretest - 17.35 \times Group\ Assignment$

Since the verbal IQ is not significantly related to the posttest scores, a simplified regression model was performed using only pretest scores and group assignment as independent variables. The results are essentially the same, with group assignment being a significant predictor of posttest scores after the pretest values are controlled in the regression model.

The small number of cases makes the use of multiple regression analysis less reliable than desired. Therefore, following the example of Langer, et.al., (1982), a non-parametric (distribution free) test of significance was used. Table 4 shows the comparison of gains for the two groups using the Mann-Whitney U Test (Mueller, Schuessler, & Costner, 1970). This test compares all possible pairs of scores, one score from each group, and examines the number of times the score from group one is larger than the score from group two and vice versa. As indicated in Table 4, there were no pairs in which the change score for the control group was larger than for the treatment group, and there were 15 pairs for which the treatment group was larger than the control group. If the two groups were equal, then the two values, U(1) and U(2), would be approximately equal, subject to sampling variation. In fact, they are as unequal as possible. The extreme difference between the two values of U(1) and U(2) casts doubt on the assumption that the two groups are equal. The observed value of U(2) can be transformed into a normally distributed z-score and the associated probability obtained from a standard statistical table. In this case, $z = 2.26$ and the probability is .023, indicating that the

Table 4

Mann-Whitney U Test Comparing Gains of the Experimental and Treatment Groups

Total Gains in Treatment Group	Number of Zero or Decreases	Total Gains in Control Group	Number of Zero or Decreases
30	1	- 6	3

$n_1 = 5$; $n_2 = 3$; $n_1 \times n_2 = 15$

$U_1 = 0$; $U_2 = 15$

$z = 2.263$; $p = .023$

Scores and Ranks by Group

Experimental Group		Control Group	
Score	Rank	Score	Rank
.0	4.0	- 3.0	3.0
9.0	7.5	- 5.0	1.5
9.0	7.5	- 5.0	1.5
8.0	6.0		
5.0	5.0		

difference is not due to chance, but to statistically significant difference in the change score of the two groups.

One last approach to significance testing can be applied. If posttest scores in conventional classrooms for L. D. students will show no improvement over pretest scores, whereas in the ITA classroom the scores will improve, then a prediction of the direction of the change for each student can be made, based on his or her group assignment. Table 5 shows the predicted and actual direction of change for each student. As indicated, the direction of seven out of eight of the change scores were correctly predicted, based on group assignment. A sign test (Ferguson, 1981) can be used to estimate the probability of making such a large proportion of correct predictions if, in fact, group assignment was unrelated to improvement in reading. This probability of obtaining seven correct guesses out of eight tries, if there is no difference due to group assignment, is .023. Thus, the sign test also supports the findings of the other statistical methods that group assignment accounts for the differences in the change in reading scores.

Conclusions and recommendations

Overall, the application of several statistical techniques to the data are convergent in indicating that the ITA treatment provided substantial benefits when compared to the effects of conventional treatment. The subjects in the experimental group's reading achievement did in fact show more improvement than those in the control group.

Table 5

Predicted and Actual Direction of Change in Scores by Group

Subjects	Predicted Direction	Actual Direction	Prediction Correct
Treatment Group			
1	+	0	No
2	+	+	Yes
3	+	+	Yes
4	+	+	Yes
5	+	+	Yes
Control Group			
6	-	-	Yes
7	-	-	Yes
8	-	-	Yes

Number Correct = 7 out of 8

Binomial Expansion (Ferguson, 1981), p. 90)

$$C_r^n p^r q^{n-r} = \frac{n!}{r!(n-r)!} p^r q^{(n-r)} = \frac{8!}{7!(8-7)!} \quad 1/2^7 \cdot 1/2^1 = .023$$

Upon close examination, the subjects in the experimental group appeared to improve in attitude as well as in the quality of work they did. With only one exception, all subjects manifested an increase in their posttest scores. One subject's score remained unchanged. However, all posttest scores of the subjects in the control group regressed and their attitudes appeared to become lackadaisical.

Other gains made by the subjects in the experimental group appeared in areas not measured by tests. The investigator observed that these students were staying on task longer, doing neater work than before, manifesting a better self-image, and cooperating with peers to a greater degree by the end of the project. The subjects in the control group stayed on task longer at the beginning of the year than they did at the end of the year. In general, they were more cooperative with each other throughout the year. It did appear that poor self-concepts influenced their work more at the end of the year. The fact that all subjects in the control group wanted to return to the regular classroom but appeared to lack self-confidence and parental support to do so could have been a contributing factor to poor self-concepts.

The use of the ITA materials with the experimental group was new to these students. They had never experienced failure with these materials, thus, expectations were higher and probably contributed to some success in reading achievement for this group.

There were, however, three problems which could not be overcome by statistical analysis. The first is the nonrandom assignment of subjects to treatment group and control group, which raises the possibility that outcome differences are the consequence of some unmeasured preexisting difference. The second is that the small number of subjects yielded a limited amount of data on which to base conclusions. The third is that statistical regression to the mean is a threat to the validity of the findings. For these reasons, case studies of the eight subjects are presented to supplement the statistical analyses (Appendix B).

In view of these problems and some controversy that has existed since the conception of ITA, the positive results of this study should be interpreted with caustion. Nevertheless, the assumption is made that ITA did make a difference in the reading achievement of the subjects in the experimental group in this study in addition to the positive change in students' attitudes and self-concept.

Recommendations

Longitudinal studies with secondary students who are low achievers or learning disabled are recommended. The teachers who work with ITA should be well trained and highly motivated to see students experience success. This approach should be discussed in more detail, not only as a historical approach but as a remedial technique, in the college and university classes in in the areas of special education and reading.

Appendix A

Procedures for Protection of Human Subjects

Jeanette Conner, Teacher
Taylor County High School
Campbellsville, Kentucky 42718

May 14, 1984

Dear Parents:

In January, 1984 I sent information home to you about a program we were using to help some students who were having problems learning to read well. This approach is called the Initial Teaching Alphabet. This has been an effective program for many students over the years. We hope that many high school students will learn to read better by use of this approach.

We would like to share the results of our program with the Initial Teaching Alphabet Foundation, the International Reading Association and/or other publishers in order for other high school students to have the opportunity to be in a similar program. The names of our students will not be mentioned in any results reported.

If you agree to permit us to use these results in a research report, please sign your names on the lines provided below. We will be glad to share our report with you at your request.

We thank you for your assistance.

Parents' signatures _____

_____

Date Signed _____

Appendix B

Case Studies

Case Studies

Case 1. Frank, a slender young man, was 14 years old and lived with his parents who were factory workers. His older siblings were married. He had transferred from another school district when he was entering the seventh grade. His mother reported that he had academic difficulties since the primary grades until the present. She reported that teachers liked Frank because of his outgoing personality and permitted him to get by without meeting the standards that had been established. At this point, he expected to be able to continue vertically in his academic program without much effort on his part to participate in the learning experiences. When informed that he would not earn passing grades if he did not work, he stated, "I have passed every year, and the teachers have told me I wouldn't. I passed last year with four Fs."

Frank was pleasant when he was not pushed to do his work. He had a very short attention span and was quite restless, indicated by squirming in his chair, looking out the window, or checking to see that his package of cigarettes was still in his shirt pocket. He was short tempered which was manifested by angry remarks and, sometimes, threats when a peer said or did something he did not like. He was frequently in the principal's office for smoking or disruptive behavior.

Frank's greatest love was showing horses for his employer. He had achieved a degree of success in this line of work. Before school was out, however, he reported he had been dismissed.

He did not know the Dolch 220 word list beyond the first grade level. He had not achieved any degree of automaticity with the multiplication tables. He counted on his fingers when adding and subtracting. He could not name or spell all the days of the week or months of the year.

His verbal score on the WISC-R was in the upper 70s. His standard score of 70 on the Reading subtest of the WRAT was unchanged from pretest to posttest.

Frank did not like the ITA program. He exerted minimal effort to learn the sound/symbol relationships. When the teacher modeled the sounds of the characters and then asked the students to respond individually, he would give up quickly when he experienced any degree of difficulty. He worked a few days, then resorted to drawing, talking, or daydreaming. There were many errors in the assignments he did complete. He was expected to correct all errors in his workbook. He eventually marked or wrote more inappropriate than appropriate answers in his workbook. At this juncture, he was permitted to return to the regular curriculum materials. The quality of his work in the regular curriculum was the same quality as his work in ITA. He showed no marked improvement in English or mathematics courses and failed his general science class.

Case 2. John was a 15 year old male who lived on a farm with his parents and one sister. John was a tall young man who looked like he could be a basketball player. He rushed to get everything finished which resulted in numerous errors. His verbal score was just over the 100 mark and indicated that John should be able to cope with academics in the regular classroom. His abilities were fairly evenly distributed over all areas on the WISC-R. His standard score on the Reading pretest of the WRAT was 100 and his posttest score was 109.

John thought ITA would be very easy. After the characters were taught, he was ready and eager to read and to get started in his workbook. However, he discovered he had rushed too much. It was necessary for him to review the sound/symbol relationships. He often resorted to review when he encountered new words. This extra time spent on analyzing new words resulted in John taking more time to comprehend the material. He completed the program about three weeks ahead of schedule and returned to the regular L. D. curriculum.

John progressed satisfactorily and was transferred to the regular classroom at the end of the year. The ITA materials were instrumental in helping John take a closer look at details and the meaning of words which enhanced his comprehension ability. The quality of his work in the L. D. curriculum was much better at the end of the year than it was before he worked through the ITA materials.

Case 3. Rex was a 15 year old male who lived with his parents and two younger brothers. Rex and his brothers were in a program for the educable mentally handicapped (EMH). However, when Rex was reevaluated at the end of a three-year placement, his scores on the WISC-R had sufficiently increased (according to his EMH teacher) to permit placement in the L. D. classroom. His verbal score on the WISC-R was in the low 70s. His standard score on the WRAT pretest was 72 and his posttest score was 81. His handwriting improved probably due to the effort required to form the ITA characters.

Rex was very shy and hesitant to read orally or answer any questions. He would not ask questions when he was given an assignment even when he did not understand the directions. When the ITA program was presented he became very excited about it. He began to ask if he could take a book home to read. He frequently asked to read to the teacher before his assigned time. He finished the program two days ahead of the schedule which was an outstanding accomplishment for Rex. He gained self-confidence and became an outgoing young man who manifested enthusiasm for learning and volunteered to help other students with their work.

Case 4. Dan was a very pleasnt 14 year old male. His only sibling was a married sister. Dan lived with his parents on a farm and preferred farm work to academics. On the WISC-R, his verbal score was in the upper 70s. His standard score on the WRAT was 74 on the pretest and 82 on the posttest. His expressive vocabulary was much better than his score might indicate. He was

well socialized and chose outdoor activities over preparing his homework assignments. Sometimes he would do his homework very well, but he would generally start it and fail to finish it before class time.

Dan stated that "ITA is too easy." ITA probably would have been very easy for him if he had applied himself well to the task at hand. His performance improved considerably when he was convinced that he must complete the ITA material before he would be permitted to return to the regular L. D. curriculum. He then settled down to work and experienced little difficulty with the materials. He did, however, get bored easily with the materials and was allowed to use some additional curriculum materials with the ITA ones, when he earned a score of 90 on the comprehension sections in the ITA workbook. One of the benefits Dan derived from the ITA program was that he learned he must meet specified requirements in order to make personal choices. Another benefit was improvement in his comprehension score on all materials.

Case 5. Tim, an only child, was a 14 year old male who lived with his parents who worked at the same factory. Tim appeared to be a favored grandchild of one of his grandmothers. He looked more like a 16 year old but was very puerile in manners and conduct, and motorically awkward.

Tim scored in the lower 90s on the verbal section of WISC-R. On the WRAT his pretest score was 84 and his posttest score was 89. He had experienced academic difficulty throughout his school experience. When reinforcement included a visit to

grandmother's house for a weekend, he managed to do his homework assignments well for an entire week. If, however, his parents informed him he had to stay home the following weekend, his work was seldom completed. His mother reported that he was a very good helper at home.

Upon first examination, Tim considered the ITA materials too easy. He rushed ahead for a few days but found himself correcting many errors in his workbook. He finally finished the program two days after the scheduled time. His work became much neater when compared with his previous work. He stayed on task for longer periods of time, which was indeed an accomplishment for him. He indicated that he would like to read stories to students in lower grades the following year. Prior to this, he never indicated a desire to read anything, much less to read to elementary children.

Case 6. Jane was a 14 year old female who appeared to be about 18 years old. She was one of ten children who lived with their parents. The parents were factory workers. Jane was very immature as evidenced by temper tantrums and fighting with peers. She needed constant approval to cope with academics. Her intellectual assessment on the WISC-R indicated that she had a verbal score in the upper 80s. On the WRAT, she earned a pretest score of 99 and a posttest score of 96.

Jane worked hard most of the year. She wanted to go out of the L. D. program into the regular classroom. However, it seemed she did not have enough self-confidence to trust herself to make

the grades in the regular classroom. A few months before school was out, she began to be friends with a group of students who chose to skip school and/or not to get their assignments. The quality of her work diminished as the school year ended. Jane continued in the L. D. program for the next year.

Case 7. Bob was a 14 year old male who lived with his parents and an older brother. He was very conscientious and tried to please his parents and teachers. He was well supported by his parents. On the WISC-R, his verbal score was just over 100. On the WRAT his pretest score was 98 and his posttest score was 93. Membership on the football team appeared to encourage Bob to work hard for good grades.

Bob was encouraged to try the regular classroom, but his parents were afraid he would not succeed. He was somewhat disappointed when his parents decided not to give their permission for him to transfer to the regular classroom from the L. D. program. His interest level towards the end of the school appeared to wane. His grades did not remain as high as they had earlier in the year.

Case 8. Sue was a rather thin, pale young lady who appeared malnourished. She was 14 years old and had several half-brothers and -sisters. She ran away from school several times with a peer who was frequently making trouble at school. On the WISC-R, she achieved a verbal score in the mid 80s. On the WRAT, her pretest score was 94 and her posttest score was 89. Before school ended, her interest had turned to other things outside the area of academics such as skipping classes or a day of school with her mother's knowledge.

Sue indicated that she wanted to become a teacher. Sometimes this inspired her to work very hard. Her home environment appeared to be a factor in her low achievement. Associating with peers who were constantly in trouble with the law and school officials created more problems than she was able to cope with and remain on task academically. She was dismissed from school for several days before school ended but returned and attempted to make up all her assignments before school was out.

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